

# Between thinking and speaking—Linguistic tools for detecting a fabrication

Rakefet Dilmon\*

*Department of Hebrew and Semitic Languages, Bar-Ilan University, Ramat-Gan, Israel*

Received 23 December 2006; received in revised form 10 March 2008; accepted 18 September 2008

## Abstract

This study describes the linguistic differences between the discourse of truth and discourse whose objective is to mislead.<sup>1</sup> The intention to mislead arouses cognitive and emotional functions in the speaker that affect his speech. An examination of the linguistic characteristics that distinguish between the discourse of truth and that of invention among 48 native Hebrew speakers who were asked to tell both true and invented stories found 13 criteria that differentiate between the two types of discourse. The criteria were classified according to the cognitive and emotional functions affecting the speaker, also addressing his level of awareness of these functions.

The objective of this paper is to demonstrate the effectiveness of the linguistic examination in differentiating between truth and deception. This effectiveness is due to the uncontrollable psychological processes that cause differences between the discourse of truth and invention. The results may enable us to construct an instrument for linguistic examination to differentiate between the two types of discourse.

© 2008 Elsevier B.V. All rights reserved.

**Keywords:** Discourse; Truth; Invention; Manipulations; Deception

## 1. Introduction: psychology of deception

The discourse of deception is discourse whose purpose is to deceive the listener. This definition is drawn from the American Heritage Dictionary's definition of the verb deceive as "to delude, mislead," with the following elaboration: "*Deceive* involves falsehood or the deliberate concealment or misrepresentation of truth with intent to lead another into error or to disadvantage" (1969:342). The reality described in a deception can be true, but be intended to mislead the listener, such as in the presentation of only part of a situation or taking words out of their context. This is unlike an outright lie, in which the reality presented is by definition unreal or distorted.

In this article I will show which linguistic criteria differentiate between the discourse of truth and of invention, I will discuss the cognitive and emotional processes affecting the language of invention, and I will show that since the speaker cannot control these processes, it is pragmatically worthwhile to use the linguistic examination to distinguish between truth and deception.

\* Tel.: +972 3 9063012/52 5620004.

E-mail address: [rak2@bezeqint.net](mailto:rak2@bezeqint.net).

<sup>1</sup> The details of the research presented here may be found in my doctoral dissertation: Rakefet Dilmon, *Linguistic differences between lie and truth in spoken Hebrew*, written in fulfillment of the requirement for the granting of the Doctor of Philosophy degree, Bar Ilan University, Ramat Gan, Israel, 2004.

The desire to expose the psychological processes involved in the act of intentional deception and the search for practical tools to improve our ability to identify a fabrication have led the way to some very productive research in this area. A number of studies dealing with the psychological motivations behind lying or deception have addressed the speaker's functioning in this situation. Davis (1961) says that an individual will show a strong psychological response when he lies, because he fears the consequences when the lie is discovered. Elad (1988), who studies polygraph examinations, bases his work on the opinion of Davis and presents three theories that may explain why the person who is lying gives himself away:

- A. The conditioned response theory—this theory addresses examinations or questions, the responses to which are lies. The questions produce a stimulus that arouses an emotional response related to events from the subject's past. The more traumatic these events were, the stronger the response will be.
- B. The conflict theory—this theory assumes that considerable physiological disturbances occur when the two possible options for a person's response are in conflict with each other; for example, the basic inclination to tell the truth and a one-time inclination to lie regarding a certain subject. Here it seems that the greater the effort that the subject makes to conceal the information, the easier it will be to expose him.
- C. The theory of punishment or of the threat of punishment—according to this theory, an individual will have a stronger physiological response when lying because he expects severe consequences to befall him if the lie is found out. In this case, it is the fear that is the factor behind the response. This theory is consistent with the theory of the threat of punishment presented by Gustafson and Orne (1963). According to this theory, the greater the danger of being punished if the lie is found out, the stronger the psychological responses, so that there is a greater likelihood that the lie might be revealed.

According to O'Hair et al. (1981), one of the traits affecting manipulative behavior and the number of clues to be gleaned therefrom is the relationship between emotional deception (including counterfeiting feelings that do not exist) and factual deception (presenting false information). They assert that when a person is practicing emotional deception, his body, from the head down, will betray the deception, and when a person is deceiving factually, it is his head that will give him away. This assertion has already been presented by Ekman (2001), who dealt with the discovery of a lie.

Ekman and Friesen (1969, 1974) made a distinction between the number of bodily signs in contrast with how many facial signs there are. In their opinion, the body parts most indicative of lying are the hands and the soles of the feet, since a person is least able to control these. The face is subject to the most control, so that it will betray fewer signs of deception. Moreover, small facial hints are harder for the observer to interpret. Miller and Burgoon (1996) observe that it is important to bear in mind that some of these cues also express things other than deception, such as stress, negative affects, discomfort, or lack of interest. When interpreting, one should exercise caution when making a determination regarding the precise factor that the cue relates to. Shekel and Cohen (1978), examining whether it is possible to detect a lie by means of a suspect's facial expressions during a polygraph examination, agree with this observation. They claim that it is possible to find hints of lying in facial expressions, but that this is apparently a matter of fear and not necessarily of lying.

In a review of prior research relating to deception, Knapp et al. (1974) present a list of behavioral and emotional phenomena influencing the deceiver: (1) nervousness and lack of patience; (2) basic restraint or reservation regarding what is said—the speaker takes back what he said before; (3) exaggerated behavior that deviates from normal discourse response patterns; (4) insecurity or vagueness; (5) incompatibility between external behavior and internal emotions.

The characteristics presented here were found to be employed by speakers who were concealing something and attempting to pose as being reliable. This paper will show how these characteristics affect the language of the speaker and cause him to exhibit signs indicating that he is not telling the truth.

From a pragmatic standpoint, deception is a deviation from the conventional rules of discourse. Mey (1993) claims that the objective of speakers is to communicate; therefore, they endeavor to be understood correctly and take pains not to make a misleading impression. According to Mey, "Communication is not a matter of logic or truth, but of cooperation; not of what I say, but of what I can say, given the circumstances" (1993, p. 57). Grice (1975) deals with the philosophical aspect of discourse. He asserts that discourse is based on a joint effort by its participants. In his opinion, what is expected of the participants is that they make whatever contribution to the discussion is required while it is taking place, in accordance with an agreed-upon objective or direction. The "Cooperative Principle" he has formulated may be subdivided into categories, or maxims (following Kant): of quantity, of quality, of relation, and of manner.

- The maxim of quantity says that the speaker must make the contribution to the discourse that is required of him. He is not to be too informative, nor should he withhold information.
- The maxim of quality requires of the speaker that his contribution to the discussion be true. He must not say things that he believes are lies or things that are unproven.
- The maxim of relation requires the speaker to share with his listeners only topics relevant to the discussion.
- The maxim of manner relates to the manner of speaking. The speaker is expected to express himself clearly, to avoid expressions that are not lucid, to avoid ambiguity, and to speak concisely and organize his words [reasonably?] well.

Grice (*ibid.*) claims that in general the speakers are required to be attentive to these maxims so that their discourse is logical and understandable. He stresses that the meticulous observance of the maxim of quality is a fundamental precondition of sorts, the fulfillment of which will ensure the operation of the other maxims. Nevertheless, there may be situations in which one of the maxims is not honored, in which case the logical or understandable nature of the discourse is compromised. The non-fulfillment of one of the maxims of the Cooperative Principle can occur in the following ways: (1) the speaker violates one of the maxims in such a way that his listeners do not notice the violation (for example, he may contribute irrelevant information to the discussion), and he thus misleads them; (2) the speaker refuses to cooperate with his listeners (for example, he refuses to answer a question); (3) the speaker causes two maxims to clash—for example, he may violate the maxim of quality by means of over-strict observance of the maxim of quantity (he provides information that is exact but falls short of clarifying what happened); and (4) the speaker is contemptuous of the maxims and does not observe them at all. In such a case the addressee, who believes that both he and his interlocutor are being faithful to the Cooperative Principle, is deceived. In the opinion of Mey (1993), a person might ignore the Cooperative Principle if by thus ignoring it he attains results that benefit him. Mey illustrates this in the world of literature. He says that good writers use techniques of concealment (deliberate omission, misleading statements, uninformative or disinformative remarks) which contradict the Cooperative Principle. In effect, they are deception experts. [Sperber and Wilson \(1986\)](#) believe that pragmatics requires one rule only: Relevance Theory, according to which “The successful communicator is one who makes his or her intention to convey information, to persuade, to make believe, etc. manifest to the partner.”

The agreement between speaker and listener that the speaker has something to convey to the listener is a good enough reason for the latter to believe the former. We believe that the author of a lie is able to rely on this belief and tell the listener things that are not true, thereby violating the maxim of Relevance.

[Galasinski \(2000\)](#) claims that deceptive communication feeds off communication that is not deceptive. In order to put a lie across, the addresser must conceal it within a discourse of truth and in non-deceptive contexts. From a pragmatic standpoint, the liar intermingles open and hidden messages. The addressee does not detect the hidden messages and believes all that he is told as a single unit. In this way the act of the lie is carried out—the deceptive messages are likely to be either expressed explicitly or else understood although not uttered outright.

Our attempts at using linguistic cues to detect attempts to mislead are based on the assumption that there is a difference between the language of an individual when he is not telling the truth and his “normal,” truthful language. [Fraser \(1991\)](#) says that this difference is the result of a feeling of stress, which is manifest in a decline in capacity for cognitive integration, in precision, in organization, and in ranking things. These difficulties result in a change in the normal elements of the speaker’s language. The fabrication is part of a large system of misrepresentation, within the framework of interpersonal communication ([Fraser, 1994](#)), and it is done consciously. Fraser (*ibid.*) says that every representation by the speaker includes a message. This message contains the content (the reality) and the speaker’s attitude toward it. A misrepresentation is the transfer of erroneous information (incorrect content) or a false attitude toward the information that is presented. A misleading attitude will be seen in inappropriate communication, such as an insincere apology, an empty promise, or a self-serving request. A combination of a misrepresentation of content and attitude is most common. A speaker has an array of possible ways to present fraudulent information. He can take the direct, explicit approach (the lie) or a roundabout one, in which his message can be inferred by the listener but is not stated outright. [Sornig \(1989\)](#) adds that the change in an auditor’s perceptions is accomplished through the way in which the things are said, without taking into consideration the degree of truth of the information.

Until the 1980s, most of the research on the lie and deception focused on non-verbal cues. Very few studies dealt with verbal cues. The 1980s saw the beginning of work on para-linguistic cues: pauses, duration of response, and errors in speech (in this paper, these cues are referred to as “the prosody of speech”) ([Shuy, 1998](#)), as well as a linguistic examination to identify a deception ([Dulaney, 1982](#)). The research of the last two or three decades included examinations

of morphology, syntax, and semantics and, in recent years, also of discourse. The findings of the researchers were various: response time was shorter, there were fewer special words, a smaller number of verbs in the past tense, and a faster speech rhythm when an individual was lying (Dulaney, 1982); there were fewer words in the discourse, as well as a tendency to short messages, there were fewer factual declarations and more general ones, linguistic ambiguity and repeated double declarations, fewer group markers (we, our, all of us) with more markers of diminishment (few, a little, hardly), more markers of the other (they), fewer personal declarations and the speaker referred to himself less (Knapp et al., 1974).

There have been a number of inadequacies in studies that have dealt with the discourse of deception. Dulaney (1982) is critical of the inconsistent definitions of the lie or of deception presented in studies that preceded his, and of their investigative methods, which do not provide the deceiver with room to maneuver and do not manage to arouse in him any real motivation to deceive. The research of Dulaney himself (Dulaney 1982:77–78), in which he attempts to avoid the drawbacks of his predecessors, falls short in that he examines his subjects in an interview setting (they respond to structured questions). Such a situation does not allow for the examination of the entirety of the discourse; moreover, it is likely that the questions themselves suggest to the respondents how they should answer. What is lacking here is the factor of individual invention. Steller and Koehnken (1989) examine testimony about sexual harassment. The linguistic criteria they found are: admission of loss of memory, unusual details, superfluous details, spontaneous corrections, and sudden complications regarding the episode (Landry and Brigham, 1992; Tully, 1998). In their examination, they focus only on children, a very specific area of investigation. The studies that examine the validity of this method for adults (Landry and Brigham, 1992; Sporer, 1997) found that this method works only when there are non-verbal clues to help the person trying to detect deception; moreover, the results are merely satisfactory, since the success rate was somewhat random. Hollien (1990) uses lexical breakdown to investigate deception (Type-token ratio, or TTR), and finds less linguistic diversity when a person is practicing deception. This is only one area of investigation. Identifying additional criteria from other areas is likely to produce better results in the discovery of a lie. The investigation of Miller and Burgoon (1996) attempts to characterize the ability of auditors or readers to detect deception, and not the actual techniques of linguistic concealment used by the speakers.

In a linguistic examination of a computer mediated text of deception, Hancock et al. (2005) found that the discourse of deception used more words, gave rise to more questions that the addresser asked the addressee, used fewer first-person pronouns, more negative words (used by liars without heightened motivation), and more sense words. The problems in this study are that a small number of criteria were examined, the discourse being studied was written (on a computer), the motivation to lie came from preliminary instructions (was not natural), and the discourse examined was a conversation (not a full text).

From the foregoing, it is evident that there is a need for research which will include: a comprehensive definition of linguistic manipulation; an examination that is scientific rather than based on hunches<sup>2</sup>; a diversified research population; the creation of motivation to use artifice; a *modus operandi* to give the person intent on manipulation room to maneuver; an entire discourse to examine (without interruption by an interviewer); a comparison of the discourse of invention with the discourse of truth (the “calibration” of the examination instrument); an examination of a variety of linguistic areas; and an examination of the linguistic tools found to significantly distinguish between truth and untruth in a real situation of misrepresentation.

This study’s objective is to satisfy all of these requirements, as follows:

1. A comprehensive definition of deception—such a definition is suggested in the introduction to this paper.
2. An examination that is scientific rather than based on hunches—this study represents a scientific investigation of 48 subjects. Each of these told four stories, three stories of truth (for an explanation of why three stories were examined rather than one, see below) and one, an invention. The study compares each subject’s stories of truth with his/her false story. The comparison was made using linguistic instruments, and the results obtained were examined statistically.
3. A diversified research population—the study includes a primary experimental group, with another smaller group to verify the results. The primary group comprised 48 native Hebrew speakers of both sexes, of different ages and a variety of backgrounds (with no criminal background). Included in the second group were five criminals known to the police who gave false testimony.
4. The creation of motivation to mislead—the subjects were told they would be cooperating in a study dealing with the words of response of Israelis; that is, a study to classify types of responses (for example: exclamatory words, utterances

<sup>2</sup> Of course, it is also possible to scientifically investigate the hunches of professional people.

relating to what has been said, and so on) in Hebrew. To that end, they were being asked to take part in a game.<sup>3</sup> In this game they were to tell two stories, one true and the other an invention, and the “real” subjects would have to guess which of the stories was true and which an invention. In this way, the subjects themselves chose where and how they would mislead, and they would be motivated to provide stories that would make it hard to identify them as stories of deception. In other words, they tried to escape detection, as would be the case in an actual deceptive situation.

5. A *modus operandi* that will allow the prevaricator room to maneuver—the subjects were asked to tell two stories from their past, one of them true and the other not, in whatever order they like. Apart from this instruction, they received no other suggestions as to subject matter, length, or any other issue of the story’s substance. Neither did the interviewer interrupt in any way in the course of the telling of the story. This approach finds support in the writings of Blum-Kulka and Liebes (1993), who claim that the richest source of linguistic information is texts produced by interviewees, and not responses to the structured questions of the interviewer.
6. An entire discourse to examine—as stated previously, the interviewer did not interrupt the flow of the story. The result was entire stories, as their tellers chose to shape them and fill them with content. These stories represent complete discourse units for examination in the research.
7. A comparison of the discourse of invention with the discourse of truth (the “calibration” of the examination instrument)—the present study is similar to the polygraph examination, which measures changes in a subject’s blood pressure, pulse rate, breathing, and the skin’s electrical conductivity when he is answering “cold” questions (questions without any emotional load) and compares them with questions touching on the deeds of which he is suspect (Elad, 1988): each subject’s false story is examined in comparison with each of his other stories. The assumption is that the true stories indicate the subject’s ordinary, “normal” language, while the stories of deception indicate a deviation from that normal language. The study examines what those deviations are, in which linguistic areas they are included, and what psychological reasons cause them.
8. An examination of a variety of linguistic areas—previous studies dealt with a partial linguistic examination of the lie. This study attempts to embrace a wide range of the areas of linguistic examination: morphology, syntax, semantics, discourse analysis, and prosody. In each of these areas, a large number of criteria likely to differentiate between the discourse of truth and of invention were examined. Some of the criteria have not been examined or identified in previous studies, but were nevertheless examined here in order to make certain that every possible differentiating area was indeed examined.
9. An examination of the linguistic tools found to significantly distinguish between truth and untruth in a real situation of invention—the results of the research on the stories of the subjects with no criminal background—that is, the criteria found to significantly differentiate between truth and fabrication in the first part of the study—were checked against the testimonies of five criminals obtained from the police. These testimonies are considered by the police to be false, thus providing the study with an authentic situation of deception for examination.

The current study has two objectives. The first is to conduct a comprehensive and extensive examination of the linguistic criteria that differentiate between the discourse of truth and of invention in the Hebrew language. The second is to attempt to produce a primary test of the cognitive and emotional functions involved in the latter type of discourse.

## 2. Method

### 2.1. Subjects

Taking part in the study were 48 native Hebrew speakers (23 men and 25 women) between the ages of 20 and 45 (average age: 30.4; standard deviation: 5.3), all with at least a high school education. The experimental population was heterogeneous, consisting of about 48% males and 52% females. About 21% of the subjects had only a high school education, and 79% had some higher education. Approximately 60% describe themselves as religious, and 40% as not religious.

All of the subjects volunteered to participate in the study.

<sup>3</sup> The subject of the “study”, together with its explanations, are of course our invention, but they satisfied the research participants’ curiosity about its objectives.

## 2.2. Instruments

In view of the lack of a prepared system of linguistic instruments for the analysis of the language of truth and of invention, in the initial stage the measures were assembled from the foreign literature and adapted to Hebrew. In addition, an attorney, a police investigator, a military police investigator, and two psychologists who had worked for the police were interviewed, in order to identify characteristics they use intuitively to ascertain when an individual under investigation or a witness is lying. From the information gathered from them, a list of 43 verbal criteria for examination was constructed in the following areas: morphology (the tense system, pronouns, and persons), syntax (word order, conjunctions, etc.), semantics (registers, obscurity, generality, etc.), discourse (distraction techniques, misrepresentation, persuasion, etc.), and speech prosody (pauses, repetitions, exclamations, and so on). [Table 1](#) itemizes the criteria for the linguistic examination.

## 2.3. Procedure

In the course of the research, each of the subjects was seen individually. The meetings were conducted in a quiet location, where no other people were present. Each meeting lasted on average one hour and was recorded from beginning to end. At the beginning of the meeting, each of the subjects was asked to tell two preliminary stories:

1. a story about his life (called “the life story”);
2. a story about his activities on any 1 day of the preceding week (“the story of a day”).

These stories served the purpose of eliciting true stories from the subjects before they were made aware of the subject of the study, for which they would be required to tell stories of deception. Actually, the preliminary stories also served as icebreakers at the start of the meeting, to form a relationship between the interviewer and the subject.

Next, the subjects were told the story of the research that had been decided upon in advance so as not to give away the study’s true intention and the information needed for the examination. As described above, the subjects were told that they were assisting in research dealing with the words of response of Israelis. They were asked to tell two stories from their past, one of them true (“the story from the past”) and the other totally false

Table 1  
Criteria for linguistic examination.

Morphology	Syntax	Semantics	Discourse	Prosody
Past tense verbs	Words in story	Emotive words and words describing emotions	Qualifying expressions	Repetition of story details
Present tense verbs	Clauses in story	References to the other	Conjunctions	Full pauses
Future tense verbs	Types of pauses	Negative words	Sudden instances of confusion during description of event	Empty pauses
First person verbs	Average length of clauses	Generalized words and specific words	Use of collocations and idioms	Spontaneous self-corrections of errors
Second person verbs	Conditional sentences	Factual declarations	Collocation fragments	
Third person verbs	Definite morpheme	Special words	Intensifiers	
Active verbs	Syntactic deviations	Synonyms	Minimizing markers	
Passive verbs			Ratio of number of types to number of tokens—TTR	
			Consistency of time of story with its structure	
			Deviations in story structure	
Free pronouns in first person				
Free pronouns in second person				
Free pronouns in third person				
Bound pronouns in first person				
Bound pronouns in second person				
Bound pronouns in third person				
Morphological deviations				



(“the fabricated story”). They were told that research subjects would hear their stories and respond to them, and would then have to identify which of the stories was the true one and which the false. The subjects did not know that it was they whose language was being studied. Thus, their speech was more natural, they were motivated to deceive other subjects, and they attempted to mislead their auditors with their true stories as well, that is, to present them as if they were fabricated stories. After telling their stories, all of the subjects were asked to tell in which of them they were lying.

At the close of the meetings, the subjects were told what the real purpose of the study was, with an explanation of why the true purpose for obtaining the fabricated stories had not been revealed to them. The subjects were asked if they would still agree to let us use the recording of their words for this study. All of the subjects gave their permission. The recorded stories were transcribed in their entirety.

A comparison was made of the four stories told by each subject: the life story, the story of a day, the story from the past, and the fabricated story. The first two stories serve as stories for control purposes, and are regarded as stories of absolute truth. There are two stories of invention: the story from the past rests on facts that are true, but the teller wants it to be heard as if it were a fabrication; and the fabricated story is based on false facts, but it is masquerading as a true story. Each of the transcribed stories was examined separately. The examination was conducted according to the criteria that had been established at the beginning of the research procedure, and according to their classification by the various test topics. The examinations were conducted in the following order: morphology, syntax, semantics, discourse, and prosody of the language of the story.

Each criterion was tallied and listed. For example, among other features examined in the area of morphology, all the verbs appearing in the story were tallied, after which their distribution among first, second, and third person in the past, present, and future tenses was examined. In addition to other criteria in the area of syntax, all the independent, dependent, and coordinate clauses were counted, together with their average length and total number.

### 3. Results

In order to examine our hypothesis that differences in the various linguistic criteria would be found between the discourse of truth and of deception, MANOVA analyses were performed with repeated measures (for each linguistic criterion, the differences between the four stories were examined).<sup>4</sup>

Thirteen linguistic criteria were found to differentiate significantly between the discourse of truth and of deception. These criteria are shown according to their distribution among the various linguistic areas.

Tables 2–6 show the results of the examination of the criteria in the various areas of the examination (except for prosody, whose results were not significant), as well as the results of the comparison of pairs that was made between the four stories examined.

The following data are discernible from the results of the examination of the means and of the comparison of pairs (the Friedman Test) shown in the table:

*Verbs in the different persons.* A significant difference [ $F(3,14) = 14.37, p < 0.001$ ] was found for the criterion “number of verbs in first person” between the four stories. In order to isolate the source of the differences, one-way ANOVA analyses were performed with repeated measures, as well as an analysis of a comparison of pairs, which revealed that the use of verbs in the first person was greatest in the life story, followed by the story of a day. First person verbs were used least in the fabricated story, and there was no significant difference between it and the story from the past. The results of the examination of the use of verbs in the third person were just the reverse. For the criterion “number of verbs in third person,” a significant difference [ $F(3,14) = 27.54, p < 0.001$ ] was found between the four stories. An examination of the source of the differences showed that the use of verbs in the third person was greatest in the fabricated story, but there was no significant difference between it and the story from the past. There was less use of these verbs in the story of a day, and their lowest incidence was found in the life story. An examination of the use of verbs in the second person did not show significant differences in their use between the stories.

<sup>4</sup> In light of the findings, an instrument for a statistical examination was constructed to distinguish between the discourse of truth and of deception. The instrument is not presented in this paper, but it can be found in my doctoral dissertation (Dilmon, 2004).

Table 2

Results of the examination of morphological criteria in the four stories.

Criteria		Stories				F(3,141)	Comparison of pairs
		Life story	Story of a day	Story from the past	Fabricated story		
Verbs in the different persons							
First person	Mean	54.22	40.34	36.34	32.36	14.37***	1 > 2 > 3 = 4
	Standard deviation	13.71	18.13	19.10	15.72		
Third person	Mean	11.95	22.22	30.04	40.78	27.54***	4 = 3 > 2 > 1
	Standard deviation	16.69	19.41	19.33	21.51		
Verbs in the different tenses							
Past	Mean	85.9	85.1	72.3	73.3	19.76***	1 = 2 > 3 = 4
	Standard deviation	9.2	17.3	22.2	23.1		
Present	Mean	13.3	13.5	22.8	22.8	12.74**	1 = 2 < 3 = 4
	Standard deviation	8.9	17.6	19.3	22.1		
Future	Mean	0.8	1.3	5.0	4.0	20.58***	1 = 2 < 3 = 4
	Standard deviation	2.3	2.8	5.9	5.2		

\*\*  $p < 0.01$ .\*\*\*  $p < 0.001$ .

*Verbs in the different tenses.* For the criterion “number of verbs in the past tense,” a significant difference [ $F(3,14) = 19.76, p < 0.001$ ] was found between the four stories. An examination of the source of the differences found that the rate of use of the past tense in the life story was similar to that in the story of a day, and this rate was greater than the rate of its use in the story from the past and the fabricated story, both of whose values are also similar. For the present and future tenses, the result is the reverse. For the criterion “number of verbs in the present,” a significant difference [ $F(3,14) = 12.74, p < 0.01$ ] was found between the stories, as was also the case for “number of verbs in the future”: [ $F(3,14) = 20.58, p < 0.001$ ]. In an examination of the source of the differences, it was found that the rate of use of verbs in the future in the story from the past was the same as in the fabricated story, and was greater than the rate of use in the life story and the story of a day, whose results were also similar.

*Number of words in the story.* A significant difference [ $F(3,14) = 3.71, p < 0.05$ ] was found for the criterion “number of words in story” between the four stories. In order to find the source of the differences, one-way ANOVA analyses were performed with repeated measures, as well as an analysis of a comparison of pairs, which revealed similar results for the story from the past and the fabricated story. These results were lower than those of the life story and the story of a day.

Table 3

Results of the examination of the syntactic criteria in the four stories.

Criteria		Stories				<i>F</i> (3,141)	Comparison of pairs
		Life story	Story of a day	Story from the past	Fabricated story		
Number of words in story	Mean	35.65	32.73	19.58	22.14	3.71 <sup>*</sup>	1 = 2 > 3 = 4
	Standard deviation	35.93	34.87	29.24	30.79		
Type of clause							
Number of independent clauses	Mean	48.83	50.87	31.52	28.70	***	1 = 2 > 3 = 4
	Standard deviation	14.67	12.87	14.23	13.57	44.14	
Number of dependent clauses	Mean	6.79	9.66	20.91	24.50	***	4 > 3 > 2 > 1
	Standard deviation	6.76	7.35	9.07	10.74	61.19	
Number of coordinate clauses	Mean	21.27	20.97	29.62	27.39	6.52 <sup>***</sup>	4 = 3 > 1 = 2
	Standard deviation	14.83	11.46	14.43	12.06		

The key for the number assignments of the stories under “analyses of comparison of pairs” is: 1 = life story, 2 = story of a day, 3 = story from the past, and 4 = fabricated story.

\*  $p < 0.05$ .\*\*\*  $p < 0.001$ .



Table 4

Results of the examination of the semantic in the four stories.

Criteria		Stories				$F(3,141)$	Comparison of pairs
		Life story	Story of a day	Story from the past	Fabricated story		
Number of emotive words	Mean	1.04	1.54	2.56	3.25	13.79***	4 = 3 > 2 = 1
	Standard deviation	1.47	1.62	2.27	2.16		
Number of words referring to the other	Mean	1.02	3.39	5.79	7.14	37.40***	4 = 3 > 2 > 1
	Standard deviation	1.46	2.88	2.85	3.99		
Number of negative words	Mean	0.75	1.56	5.93	5.56	47.88***	4 = 3 > 2 > 1
	Standard deviation	1.12	1.38	4.57	2.64		
Type of word							
Specific	Mean	21.22	19.20	14.12	13.39	32.70***	1 > 2 > 3 = 4
	Standard deviation	4.95	5.43	4.90	4.41		
Generalized	Mean	78.78	80.80	85.88	96.61	32.70***	1 < 2 < 3 = 4
	Standard deviation	4.95	5.43	4.90	4.41		

\*\*\*  $p < 0.001$ .

Table 5

Results of the examination of discourse in the four stories.

Criteria		Stories				$F(3,141)$	Comparison of pairs
		Life story	Story of a day	Story from the past	Fabricated story		
Number of conjunctions	Mean	6.47	8.14	9.56	10.83	11.82***	4 = 3 > 2 > 1
	Standard deviation	3.18	3.63	3.82	5.66		
Incidents of sudden confusion	Mean	2.39	2.68	5.12	4.72	20.81***	4 = 3 > 2 = 1
	Standard deviation	1.63	2.07	2.32	3.14		
Number of uses of collocations	Mean	0.18	0.31	0.85	0.79	7.98***	4 = 3 > 2 = 1
	Standard deviation	0.44	0.74	1.09	1.01		
Type-token ratio	Mean	73.83	74.08	69.37	68.79	6.87***	1 = 2 > 3 = 4
	Standard deviation	8.39	8.94	9.91	9.75		

\*\*\*  $p < 0.001$ .

*Types of clauses.* A significant difference [ $F(3,14) = 44.14$ ,  $p < 0.001$ ] was found for the criterion “number of independent clauses” between the stories. A significant difference was also found for the criterion “number of dependent clauses” between the stories [ $F(3,14) = 61.19$ ,  $p < 0.001$ ], as well as for the criterion “number of coordinate clauses” [ $F(3,14) = 6.52$ ,  $p < 0.001$ ]. Examination of the source of the differences showed that the numbers of dependent and coordinate clauses were higher in the fabricated story and in the story from the past than the numbers found in the story of a day and the life story. In an examination of the independent clauses, the opposite

Table 6

Results of the examination of “deviations in story structure” in the four stories.

Criterion		Stories				McNemar's comparison of pairs
		Life story	Story of a day	Story from the past	Fabricated story	
Deviations in story structure						
Exist	Number	4	6	14	21	3,4 > 1
	Percentages	8.33	12.50	29.16	43.75	
Do not exist	Number	44	42	34	27	4 > 2
	Percentages	91.66	87.50	70.83	56.25	

results were found. The results of this examination in the fabricated story and the story from the past were lower than those of the story of a day and the life story.

*Number of emotive words.* A significant difference [ $F(3,14) = 13.79, p < 0.001$ ] was found for the criterion “number of emotive words” between the four stories. In order to find the source of the differences, one-way ANOVA analyses were performed with repeated measures, as well as an analysis of a comparison of pairs, which revealed that the number of emotive words in the story of a day was similar to their number in the life story, and was lower than the number found for the story from the past and the fabricated story.

*Number of words referring to the other and number of negative words.* A significant difference [ $F(3,14) = 37.40, p < 0.001$ ] was found for the criterion “number of words referring to the other” between the four stories. A significant difference was also found [ $F(3,14) = 47.88, p < 0.001$ ] for the “number of negative words” criterion between the four stories. The examination of the source of the differences showed that the number of words referring to the other and the number of negative words in the story of a day were lower than their numbers in the story from the past and the fabricated story, and their lowest value was found in the life story.

*Type of word.* A significant difference [ $F(3,14) = 32.70, p < 0.001$ ] was found for the criteria “number of specific words” and “number of generalized words” between the four stories. In the examination of the source of the differences, it was found that the use of specific words was least in the fabricated story, but there was no significant difference between it and the story from the past. There was greater resort to specific words in the story of a day than in the story from the past and the fabricated story, and the most extensive use of these words was in the life story. The examination of the generalized words revealed that their relative number was greatest in the fabricated story. A smaller number was found for the story from the past, although there was no significant difference between the two stories. A smaller number of generalized words were found in the story of a day, and the fewest in the life story.

*Number of conjunctions.* A significant difference [ $F(3,14) = 11.82, p < 0.001$ ] was found for the criterion “number of conjunctions” between the four stories. To find the source of the differences, one-way ANOVA analyses were made with repeated measures, as well as an analysis of a comparison of pairs, which showed that the number of conjunctions in the fabricated story was higher, but not significantly, than their number in the story from the past. These results were higher than those of the examination of the life story, which were the lowest of all.

*Number of incidents of sudden confusion and use of collocations.* A significant difference [ $F(3,14) = 20.81, p < 0.001$ ] was found for the criterion “incidents of sudden confusion” between the four stories. The same was true for “number of uses of collocations”:  $F(3,14) = 7.98, p < 0.001$ . Examining the source of the differences revealed similar values for incidents of sudden confusion and uses of collocations in the fabricated story and in the story from the past, and this number was larger than that found for the story of a day and the life story.

*Type-token ratio for the story (TTR).* A significant difference [ $F(3,14) = 6.87, p < 0.001$ ] was found for the “TTR” criterion between the four stories. The results of the examination of the source of the differences bear witness to a similar TTR in the fabricated story and in the story from the past; this ratio was smaller than the one found in the story of a day and the life story.

*Deviations in story structure.* Among the criteria for the discourse analysis, we also examined the criterion “deviations in story structure” dichotomously; in other words, a story with no deviations was marked 0, and one with deviations, 1. This criterion is categorical; therefore, it was not possible to calculate its mean and standard deviation or to perform analyses to compare means, as was done for the continuous measures.

Distribution of the subjects according to their answers within this criterion is presented in Table 6. The table also shows the results of the analyses of McNemar’s comparison of pairs.

Perusal of this table reveals that in all areas of the examination in which significant differences were found between the stories, the results of the examination of the life story and the story of a day were close to each other, and they were significantly different from the results of the examination of the story from the past and the fabricated story. The results of the examination of the story from the past and the fabricated story were also close to each other.

#### 4. Discussion

Even from the early stages of this study, we expected to find a similarity between the story from the past and the fabricated story. Both of them were told after the subjects knew that the study involved lying, and they had a personal interest in weaving elements resembling lies into their stories from the past to make them escape detection and be

considered true. The results of the linguistic examination in all areas confirm this kinship to a high degree. The similarity between the story from the past and the fabricated story is probably the result of the fact that both are artificial stories, apparently containing elements of invention, even though the invention in the fabricated story is absolute, while that in the story from the past is based on actual events. According to Johnson and Raye (1981), the description of an event more than 10 days after it happened will be less accurate and will contain more elements of invention than will be found in the description of an event after a shorter time. Fraser (1991) adds that time blurs the memory, and with the passage of time, what remains are only a general description and some key points of the event that occurred. The individual supplies the details using invented information based on his past experience or on what he believes the description should contain. These explanations are likely to clarify the similarity between the story from the past and the fabricated story—the story from the past also contains invented elements—although it must be borne in mind that the two are not identical, since at the heart of the fabricated one there is no actual basis to provide the speaker with key points or with a general description of the event. Because of the similarity between the story from the past and the fabricated story, in both their artificial elements and the elements invented so as to mislead, we relate to both of these stories in this study as **narratives with invented scripts**. We relate to the other two stories, distinguished from them by many characteristics, as **narratives with factual scripts**.

It can be seen from the presentation of the results that 13 linguistic characteristics were found which differentiate between narratives with factual and invented scripts. In an attempt to understand the various psychological mechanisms underlying the unique linguistic characteristics of the latter, these traits were classified into two groups: the linguistic manipulations of invention, theoretically performed voluntarily; and the cognitive and emotional functions that occur as the speaker utters his prepared speech, functions that it is hard for the speaker to control or whose influence is manifest in differences between narratives with factual and invented scripts. We will present each of these groups and illustrate the linguistic characteristics they contain using stories recorded during the research.

#### 4.1. Linguistic manipulations of invention

One who speaks with intent to mislead employs three kinds of linguistic manipulations: concealment and vagueness, persuasion, and the distancing of responsibility, the purposes of which differ from each other. These three types of manipulation are manifest in many characteristics in the language of narratives with invented scripts, characteristics missing in narratives with factual scripts, and as such, they differentiate between them.

Table 7 shows the classification of the results of the linguistic examination according to the linguistic manipulations of invention.

**Concealment and vagueness.** **Concealment** is the removal of any term that might make it possible to confront the misleading text with reality or that can show that what is told is incompatible with the facts, the withholding of “loaded” details from the discourse (details likely to give away the invention), and the use of words that do not contribute any new information to the story. **Vagueness** is the use of words whose meaning could be interpreted in more than one way and which do not provide a precise description of the event. Narratives with invented scripts are those that represent something that did not exist as if it did or something that took on a form that differs from what really was. The producer of such a text must see to it that no one will be able to detect in it any hint that the text is not accurate. The speaker conceals those details that could be examined and obscures the atmosphere that the story reflects by using general terms or by saying things that cannot be verified (Chapman, in press; Johnson and Raye, 1981; Dulaney, 1982).

Mey (1993), referring to “The General Principle of Cooperation” of Grice, writes: “When a vague expression such as “some” or “many” is used, we appeal to the others’ understanding of ourselves as cooperative language users:

Table 7  
Linguistic manipulations of invention.

Concealment and vagueness	Persuasion	Distancing of responsibility
Number of words in the story	Use of collocations and idioms	Verbs in the different persons
Types of clauses	Emotive words	References to the other
Conjunctions		
Verbs in the various tenses		
Specific words and generalized words		

we want them to assume that we used the right term for the circumstances” (Mey, 1993:56). When we lie, the auditor’s assumption remains intact, so that our objective of misleading him has been realized.

It was found in our study that the speaker’s desire to obscure his words and conceal their problematic details triggers many changes that take place in his narratives with invented scripts, in comparison with his narratives with factual scripts:

1. The number of words in the narratives with invented scripts is smaller—the speaker tends to speak less or to speak very briefly, apparently thinking that the less he says, the fewer details he might reveal that could help the person seeking to detect the invention.
2. Narratives with invented scripts contain more coordinate and dependent clauses and fewer independent clauses—using coordinate clauses enables the speaker to economize with his words (in Hebrew). The subordination testifies to a dynamic process and imparts a rhythm of “breathlessness” to the story, on account of which the person hearing the story hastens to what is new information in the sentence and “en route” misses what is said within the dependent clauses (Fruchtman, 1990). In contrast, narratives with factual scripts state facts, which are presented in simple sentences.
3. The conjunctions in narratives with invented scripts are more numerous, in light of the extensive use of compound and complex sentences that they entail.
4. Narratives with invented scripts contain fewer verbs in the past tense and more in the present and future. From the standpoint of content, a person intending to mislead can tell a story that may sound completely true, but in linguistic terms he uses verbs in the present or future tenses, whose significance is that the story has not yet taken place or has not happened at all. A further reason for the use of present or future verbs is the speaker’s desire to prevent an examination to verify what has been said. When he tells about something that is going on at the moment or that has not occurred yet, the matter cannot be examined. He can thus, if confronted with his invention, use the excuse that he never said that these things **really** happened.
5. More general and fewer specific words are to be found in narratives with invented scripts—using many generalized words is evidence of the speaker’s lack of close personal acquaintance with the matters he is describing, or of his attempt to obscure by distancing his words from a precise description of details. In this way, he conceals what he does not want to be known (Knapp et al., 1974; Chapman, in press; Johnson and Raye, 1981; Sornig, 1989).

Several examples of the use of techniques of concealment and vagueness are in evidence in a passage from the fabricated story of subject number 35:

*It was...the Japanese police, that we didn’t have the vaguest uh notion (generalized word) why...they stopped us, what we did (subordinate clause), uh, what we’re supposed (use of present tense) to do, uh, we got out of the car now, uh, you’ve got to understand that the Japanese...they uh...don’t know (use of present tense) how you speak Hebrew at all (dependent clause), ahem. We started...uh...to talk to them to shout at them they started to shout at us and...and...anyway they um...they go on like this for 20 min...scream at us in and...shout (use of present tense) at us, we didn’t know what to do, in the end when they saw we have...Da...a child (generalized word) in the car, somehow they started to feel sorry for us and told us that we should (use of future tense)<sup>5</sup> follow them (conjunction and dependent clause)...and...in the end uh...we decided to phone my hus...uh [first name]’s my husband’s parents, and...not in the end but pretty much at the beginning we phoned [first name]’s parents (coordinate clause), we told them they should (use of future tense) clear up what’s going on, what is this...*

**Persuasion.** Persuasion is a technique used by a speaker who wishes to steer the thinking of those listening to him in a certain direction that the speaker desires. Persuasion techniques are in particularly extensive use in advertising and propaganda (Nir, 1984; Landau, 1987; Nir, 1988; Van Dijk, 1997; Nordhielm and Suzuki, 2000; Nordhielm, 2003). In Sornig’s opinion (1989), the mechanism of persuasion works on cognitive arguments.

This study shows that many techniques of persuasion are also applicable when an attempt is being made to mislead. The speaker attempts to persuade his listeners that his words are correct and to steer their thinking and belief in the direction of what he says. The success of his persuasion can help him to evade punishment or to derive benefit from misleading his listeners; as a result, the ability to persuade is of great value.

<sup>5</sup> The future tense and the imperative are used interchangeably in Hebrew.

The desire of the speaker to persuade his listeners is manifest in the research results in several measures:

1. Greater use of collocations and idioms in narratives with invented scripts. Collocation is defined as “any sequence of words tending to appear together and in a set order” (Tourey and Margalit, 1973:100). This is one of the external means that the speaker employs to raise the level of his language so as to sound credible.
2. Many repetitions of details. These are repetitions of words or sentences which were uttered in close proximity to each other. Such a tactic is a form of “brainwashing” of the listener, as if the more times the words are spoken, the more correct they are. The tactic is also an attempt to demonstrate the speaker’s practical and emotional familiarity with what is being described, although it was never really experienced by him. Nir (1997), in his paper on political slogans, notes that word repetition is a rhetorical technique that makes the subject under discussion catchier and easier to remember (ibid.).
3. Exaggerated number of emotive words in narratives with invented scripts. The deceiving speaker will exaggerate in his use of emotive words, in order to impart credibility to his words (Landau, 1987; Sornig, 1989). If true stories testify that the speaker makes normative use of emotive words, why should he increase his use of these words? The reason must be his conscious attempt to sound believable, and he therefore in fact exaggerates their use.

A passage from the fabricated story of subject number 2 exemplifies a number of instances of the technique of persuasion:

*The . . . promoter decided uh that he . . . he would get us to sign. He got us to sign about the . . . that deal. He . . . I understood that . . . we couldn’t get out of it (idiom). We had to go on with the . . . enterprise, and . . . there was an agonizing moral debate (emotionalism). And because I know both sides of the system, u-va-e . . . I understand what it can do, I decided to go to the department. The department of uh Rafael [Israel’s Authority for Weapons Development] at . . . the Technion [University]. And . . . I went to them and I made my case before (collocation) the . . . before the . . . main man in charge. I should point out that this man in charge was a promoter from uh the business world, purely [business]. He wasn’t a part of . . . the university. So he denied my claims (collocation) and said nothing would come of it anyway (idiom), or I don’t have anything to be afraid of (emotionalism), and everything was fine and dandy (collocation). That’s it. So uh . . . it turned out that in the end after we finished that project and it was our final project that . . . came out really well, brilliant, and . . . we got a grade of “excellent”, I realized that . . . that project, that enterprise, helped uh to develop a product that . . . was sold to . . . Arab states, and they use it in . . . in their tanks, it improves their ability uh to intercept a night action. Uh, it’s on my conscience (emotionalism). To this day.*

**Distancing of responsibility.** The **distancing of responsibility** can be of two types: One, the speaker’s desire to distance himself from the physical situation of giving testimony or the story of an event that did not happen. The speaker demonstrates discomfort from finding himself in a situation in which the act of misleading occurs, and from the necessity (whether arising from external or internal factors) of being in such a situation. He attempts to minimize his part in the story, and thereby also his responsibility for what is told. The second type is the distancing of the story itself from any possibility of examining it closely, either verifying it or proving that it did not happen. In this case, the content of the story is manipulated; all the details that might be examined are removed from it, and with them, any possibility of confronting the speaker with what he said (Knapp et al., 1974; Dulaney, 1982).

The speaker’s desire to distance himself from a description of the event and from the possibility of accepting responsibility for his actions can be identified in two areas:

1. Greater use of verbs in the third person and minimal use of verbs in the first person in narratives with invented scripts—in such narratives, greater use was found of third person verbs. Changing verbs in this manner indicates an attempt on the part of the speaker to distance himself from the invented situation and from the possibility of being caught out. By using the technique of “they did” or “he said,” the speaker renders himself passive or he disappears from the description of the occurrence, and if he is passive, he bears no responsibility for the results.
2. More references to the other in narratives with invented scripts—this finding testifies to the speaker’s ability to conceal his feelings about fabricating without explicitly changing the content of the story, in keeping with the findings of the studies of Knapp et al. (1974), Johnson and Raye (1981), and Dulaney (1982). The extensive use of references to the other enables the speaker to distance himself from the situation described—to make himself

merely a supporting player, in that he makes others the subjects of his sentences. This extensive use of references to the other will enable the speaker to evade responsibility for his actions at some future date, if he is ever confronted with his words. He didn't do them; others did. This is consistent with the morphological examination, in which liberal use of third person verbs was found—in other words, an emphasis on the “other”, in contrast to a minimal resort to verbs in the first person.

The fabricated story of subject number 5 illustrates the speaker's attempts to distance responsibility:

*1982, the city of Yamit, uh, I'm 12 years old, ahem, my parents and fam. . . my parents and the whole family (references to the other) uh decided (third person) to go down to the Sinai to the city of Yamit to. . . identify with the settlers, I was in the sixth grade, and we actually go down ahem, to give them the feeling we're with them and want uh to help them to prevent the pullback, throughout the whole period nobody believes (third person) that the pullback will really arrive (third person), and. . . the day of the evacuation does in fact arrive (third person), thousands of soldiers and bulldozers (references to the other) arrive (third person), uh, they come (third person) to destroy our homes, naturally the parents (references to the other) uh oppose (third person) any uh. . . any violence whatsoever, soldiers (references to the other) arrive (third person) at the house, they cry (third person), and soldiers (references to the other) cry (third person), and bulldozers (references to the other) wreck everything and destroy houses, and bury refrigerators (third person), and. . . my parents (references to the other) ask (third person) all of us to get into the car, I don't want to, and I run away, and I hide on one of the roofs, and a police unit (references to the other) arrives (third person) and tries (third person) to climb up onto the roofs, and doesn't manage (third person) to catch me. . .*

#### 4.2. Cognitive and emotional functions

Apart from linguistic manipulations, there are also cognitive and emotional functions that influence the changes in the language of the speaker. At issue here is a deceleration of cognitive activity, and the speaker's negative attitude towards being deceptive.

Table 8 presents a classification of the results according to these cognitive and emotional functions.

*Deceleration of cognitive activity.* Deceleration of cognitive activity results from the fact that the fabrication of a story demands intensified cognitive activity, meticulousness, and an ability to invent, yet the stress created by the fabricating situation actually inhibits these skills (Johnson and Raye, 1981; Dulaney, 1982).

The stressful situation (because of the fear that the fabrication will be unmasked or because of one's upbringing, which taught him to keep his distance from falsehood) makes it impossible for the speaker to have complete control over what is said, as problems with concentration often characterize stress.

The deceleration of a speaker's cognitive activity, as we found in this study, is primarily manifest in the changes occurring in the area of discourse, and it is expressed through difficulties in the production of a coherent text:

1. Numerous incidents of sudden confusion in narratives with invented scripts—the incidents of sudden confusion may be: superfluous repetitions of what has already been said; a problem with the description of the incident that the teller does not know how to solve; a prolonged description of events unconnected with one another; and breaks in the story that include sudden jumps from one matter to another or gaps in the story of a day. A count was also made of all the times the teller changed the verb tenses in the course of his story. In the description of an occurrence, each change from using one of the persons to a different one or from a possessive pronoun in one person to another was also tallied. The large number of incidents of confusion found in the narratives with invented scripts unmasks the

Table 8  
Cognitive and emotional functions (apparently involuntary).

Deceleration of cognitive activity	Negative attitude
Incidents of sudden confusion	Negative words
Deviations in story structure	
TTR	



- internal confusion of the speaker who is making up his story as he speaks. It is difficult for him to master the content and his presentation at one and the same time, with the result that his story is confused and unclear.
2. Deviations in story structure in narratives with invented scripts—the reference is to a description inconsistent with reality, such as prolonging marginal descriptions and curtailing subjects ostensibly pertinent to the event. [Stein and Glenn \(1979\)](#), in their attempt to describe the “story grammar”, assert that the testimony of veracity may be divided into three parts of equal size: the opening non-essential text (introduction), then the core narrative, and finally the closing non-essential text (conclusion and distancing from the event). Deviating from this structure indicates false testimony (so claim [Sapir \(1987\)](#) and [Rabon \(1994\)](#). Sapir developed a method for analyzing written or transcribed (SCAN—Scientific Content Analysis) discourse, which includes a list of linguistic and non-linguistic criteria believed to enable the interrogator to identify elements of lying in discourse. Rabon developed an interviewing technique called Investigative Discourse Analysis (IDA), which is similar to Sapir’s method, except that Rabon’s deals with spoken or transcribed discourse. Sapir and Rabon’s claim was examined and corroborated in the present study). In narratives with invented scripts, many such deviations were found.
  3. Low TTR in narratives with invented scripts—TTR is an examination of the ratio of the number of types to the number of tokens in a unit of discourse. This is a statistical examination, performed by dividing every story into 50-word units (tokens) and counting the new words that do not repeat themselves (types) in these units. A low TTR result is an indication of many word repetitions and is evidence of language that is somewhat impoverished, less varied. Low TTR results were found in narratives with invented scripts.

The manifestation of the deceleration of cognitive activity is demonstrated in a number of fabricated stories. There are many instances of confusion in the fabricated story of subject number 7:

*And I’m winding and. . .and it’s da. . .dark and the flashlight doesn’t reach to see anything from the water and. . .it wound (change in tense) and then I’m sort of standing at the end of the. . .pier. . .Nu, usually fish at Tel Baruch (jumping from one subject to another). I’m standing at the end of the pier when. . .so it doesn’t get caught, if there’s anything I thought for sure some garbage from the sea. And. . .then I start to pull up the. . .uh. . .it and I wind up the reel. And dr. . .I pull it up (superfluous repetitions) and I feel. . .I see some (a problem with the description that the narrator did not know how to solve) I don’t know what to call it, it’s sort of black and. . .at the end. At the end something moved and I thought (change in tense) some plastic bags and seaweed got caught (superfluous repetitions) and I lay it on the pier, and I shine the flashlight on it and an octopus emerged. A giant. Th. . .a giant uh. For us (pronoun changes) it was big, more than a kilo (superfluous repetitions).*

Subject number 33’s fabricated story contains deviations in the story structure. This story clearly lacks the closing non-essential text, which should be the gradual concluding of the story and distancing from the event. In their stead, there is a compressing of all that happened in the end into one sentence. Such compression is likely to indicate the subject’s desire to conclude the description hastily and to distance herself from the invented situation:

*And on. . .on the day the course ended, I was sitting with another uh. . .one who finished the course with me, we sat together and sang, she played the piano and I sang. She commented that I have a very nice voice and why didn’t I go and audition, and I told her I simply didn’t know how. And. . .a few days after that, she told me that . . .a friend of hers was one of the judges, and she spoke with her, spoke about her, spoke about me with her. And she got me an audition and I went, and. . .I sang and I performed, but in the end they discovered that I’m religious so they turned me down.*

An example of a story with a low TTR (56.2%) can be found in the fabricated story of subject number 27 (for purposes of comparison, it should be pointed out that the average TTR results in the true stories was 78%):

*The first story, uh, my boyfriend, lived in Beer Sheva, and I lived in Jerusalem at the time, and. . .he apparently was crazy about me, and. . .he used to come almost every day, uh, to visit me. He used to. . .work awfully hard, and. . .at the end of every da. . .almost, al. . .almost every day of the week he used to come to visit. He used to drive. . .in the evening and go back very very late at night. Used to drive like a. . .lunatic, he used to brag about it too every time how fast he drives.*

**Negative attitude.** The speaker’s **negative attitude** toward his invention has its source in the speaker’s insecurity from being in the position of misleading the listener. This attitude is expressed in negative affects, which the speaker

integrates into his words (Knapp et al., 1974; DePaulo et al., 1985; Miller and Burgoon, 1996). This research finds evidence of the speaker's negative attitude toward being in the position of lying in his overuse of negative words in narratives with invented scripts. These were found in the semantic examination.

Negative words—these are words of negation (no, there is no, can't) or words with a negative semantic load, such as failure, hit, attack, evil, etc. The use of negative words was found to be greater in narratives with invented scripts in comparison with those of factual ones. The large number of negative words is evidence of the speaker's negative attitude toward what he is saying (Sovran, 2000:79–81). This finding shows the great weight of upbringing and social conventions, which reject misleading, both by the speaker and in his language (Fraser, 1994). From early childhood, a person is taught that misleading is negative and forbidden. This education does not necessarily guarantee that a person will be absolutely honest at all times, but it does influence his attitude toward the act of misleading. This attitude is expressed in the words the individual chooses to use. In terms of content, nothing about the use of these particular words changes the story in any way, but semantically there is a difference between the words selected when fabricating and those in use in other circumstances. This difference can indicate a fact that the speaker does not want to reveal—his negative attitude toward what he himself is saying.

An example of the extensive use of negative words can be seen in a short excerpt from the fabricated story of subject number 31. About a quarter of the words in this passage are negative words:

*And...one night everything of mine was broken into, and we simply suffered losses, and...really not a nice situation. And...We simply lost everything. Since then our...uh...economic situation is very hard.*

The five processes that were found to effect linguistic changes in narratives with invented scripts as compared with narratives with factual scripts are divided into two groups:

1. Voluntary processes (concealment and vagueness, persuasion, and the distancing of responsibility);
2. Involuntary processes (deceleration of cognitive activity, and a negative attitude).

The question arises: how clear and unequivocal is this division? The three linguistic manipulations that the speaker employs to enhance the effectiveness of his attempt to mislead are apparently conscious acts. The speaker uses subordinate and coordinate clauses, uses more verbs in the third person and fewer in the first, makes extensive reference to the other, and so on. Is it possible for a speaker to really be in conscious control of all of these changes? To all of this can be added the fact that the speaker finds himself in a stressful position that influences his cognitive ability. In light of the above, can he still consciously deploy the linguistic manipulations that will give him an advantage? Judging by the results presented above, we see that the manipulations were indeed deployed. Many measures affected by these manipulations were found to differentiate significantly between the narratives with invented and factual scripts. The question is whether the speaker would be able to voluntarily stop employing these measures, so that the misleading content of his words would not be given away with the revelation of the “incriminating” measures.

Apparently, despite the difference between the two groups, the expression of the processes is actually similar. That is, whether the process is a voluntary manipulation or not, its linguistic results are produced subconsciously, and the speaker lacks the ability to control them. The speaker lacks mastery over their utterance and cannot consciously will the cessation of their operation. According to Chomsky (1980), human beings have the innate ability to absorb and use language. This ability includes the subconscious familiarity with the rules of grammar, syntax, and semantics. People are not conscious of these rules when they are using language; therefore, it will be difficult for them to exercise conscious control when the need arises (Reber, 1997). Schwarzwald (1997) deals with distinguishing between language knowledge and language awareness. According to her, language knowledge is mastery of vocabulary and rules of language, together with a pragmatic grasp of the circumstances of its use; that is, “the accepted use of language according to registers and according to the social groups that come in contact with it” (Schwarzwald 1997:400). Language awareness, in contrast, is an intellectual recognition of the linguistic phenomena, alertness to them, and their conscious use. The speaker uses language naturally and intuitively, and he is not in control of all that he says.

The same is true of the prevaricator. His language changes when he speaks with intent to mislead, in the wake of the changing circumstances (the need to conceal, the desire to persuade, etc.) but as Ekman (2001) says, liars do not control and maintain vigilance over all forms of their behavior simultaneously. They probably would not be able to do so if they wanted. That an individual could successfully control everything he does as well as what could give him away, from the tips of his toes to the top of his head, is an unreasonable assumption.

Confirmation of this may be found in psychological theories dealing with the subconscious. These theories have focused on the cognitive subconscious; that is, the way in which the mind processes concept and knowledge. One of the opinions adduced on this issue posits that we cannot be aware of all the many processes that take place simultaneously in our minds (Reber, 1992). The content of the human being's perception and knowledge, which includes broad linguistic knowledge, influences his opinions and his behavior (including his linguistic behavior), but this is not done consciously (Hilgard, 1992).

This study provides support for this approach in the large number of criteria from various areas of language which were found to differentiate in every group between narratives with factual scripts and without them. Even if the speaker is acquainted with the criteria in which a change between the language of truth and of invention occurs, he cannot possibly master them and censor the change occurring in his language in so many areas. For example, a speaker can take great care to use only past tense verbs and independent clauses in his story, but it will be difficult for him, at the same time, to control the number of generalized and of emotive words that he expresses, not to mention the difficulty of keeping the story structure coherent and avoiding sudden instances of confusion. These findings reinforce the claim that the presence of specific linguistic differences between narratives with factual scripts and those that are suspect can be an indication of an attempt to mislead.

## 5. Conclusion

Narratives with invented scripts and with factual scripts differ from one another in 13 linguistic criteria belonging to various areas of language: morphology, syntax, semantics, and discourse.

An examination of the processes affecting the language of invention shows that linguistic execution is unconscious and not subject to the speaker's control.

With the help of the above, the process and result outcomes of language intended to mislead can be described as follows:

1. Cognitive and emotional functions: attempts to carry out linguistic manipulations influence the speaker to change his language when he is being untruthful. Apparently the change is made unconsciously.
2. The change occurs in many components of the language: morphology, syntax, semantics, and discourse. The principal change occurs in the small details of the discourse, such as vocabulary and grammatical forms, and a lesser change occurs in its general parts (Dilmón, 2004, 2007).

The instrument for linguistic examination is another in the struggle to search out misleading elements in discourse, and it could also help in the struggle to identify deceit. The product of this study is a linguistic instrument that makes it possible to discern these elements. In order to detect an attempt to mislead, investigators must look for these linguistic phenomena in narratives and draw inferences accordingly regarding the level of the speaker's reliability.

In my doctoral dissertation, an attempt was made to examine whether these results were also valid in a situation of actual deception. As written above, we examined the depositions of five criminals, which the police considered to be perjuries, using statistical instruments based on the findings of the study. The linguistic examination identified four of these as perjuries. Clearly five is too small a number of testimonies, and further research is necessary to examine the present study's findings in a situation of a real investigation or testimony in a court of law. The results of such research will lead the way to an instrument for a linguistic examination to differentiate between the discourse of truth and of deception. Such an instrument would be useful in many areas of life: the police, courts of law, employment interviews, and interpersonal relations. In addition, since at present the speaker's level of awareness at the moment of misleading can only be approximated, it is worthwhile to examine it and the emotional and cognitive processes involved in producing narratives with invented scripts directly and empirically in future studies.

## References

- Blum-Kulka, Shoshana, Liebes, Tamar, 1993. *Framing the Intifada: People and Media*. Ablex, Norwood, NJ.
- Chapman, David, in press. *The rhetoric of deception: Nixon and the Watergate*, University of Oklahoma at Norman, Department of Communication.

- Chomsky, Noam, 1980. Language and unconscious knowledge. In: Chomsky, Noam (Ed.), *Rules and Representations*. Columbia University Press, New York, pp. 217–254.
- Davis, Richard C., 1961. Psychological responses as a means of evaluating information. In: Biderman, Albert D., Herbert, Zimmer (Eds.), *The Manipulation of Human Behavior*. J. Wiley, New York, pp. 142–168.
- DePaulo, Bella M., Stone, Julie L. & Lassiter Daniel, 1985. Deceiving and detecting deceit. In: Schlenker Barry R. (Ed.), *The Self and Social Life*. McGraw-Hill, New York, 323–370.
- Dilmon, Rakefet, 2004. Ifyunim leshoni'im shel sfat sheker behashva'ah l'sfat emet [Linguistic differences between lie and truth in spoken Hebrew]. Doctoral Dissertation, Bar Ilan University, Ramat Gan, Israel.
- Dilmon, Rakefet, 2007. Hamtza'ah o metzi'ut?—Hashva'ah ben sipur sheker l'sipur korot chayim [Invention or reality?—A comparison of a fabricated story with an autobiographical story]. *Hebrew Linguistics* 59, 23–42.
- Dulaney Jr, Earl F., 1982. Changes in language behavior as a function of veracity. *Human Communication Research* 9, 75–82.
- Ekman, Paul, 2001. *Telling Lies: Clues to Deceit in the Marketplace, Politics, and Marriage*. W.W. Norton, N Y, London.
- Ekman, Paul, Friesen, Wallace V., 1969. Nonverbal leakage and clues to deception. *Psychiatry* 32, 88–106.
- Ekman, Paul, Friesen, Wallace V., 1974. Detecting deception from the body or face. *Journal of Personality and Social Psychology* 29, 288–298.
- Elad, Eitan, 1988. Ivchun psychophysiologi bemivchan HAPACHAM ('pirtei chakira muchmanim') [Psychophysiological detection in the details of an undercover investigation examination]. Doctoral Dissertation, Hebrew University, Jerusalem.
- Fraser, Bruce, 1991. Questions of witness credibility. In: *Working Papers Series Program on Negotiation*. Harvard Law School, Cambridge, MA, pp. 3–91.
- Fraser, Bruce, 1994. No conversation without misrepresentation. In: Parret, Herman (Ed.), *Pretending to Communicate*. W. de Gruyter, Berlin, pp. 143–153.
- Fruchtmann, Maya, 1990. Leshona shel sifrut: iyunei signon vetachbir besifrut ha'ivrit. In: *The Language of Literature: Studies of Style and Syntax in Hebrew Literature*. Reches, Even Yehuda, Israel.
- Galasinski, Dariusz, 2000. *The Language of Deception—A Discourse Analytical Study*. Sage, Thousand Oaks, CA.
- Grice, Herbert Paul, 1975. Logic and conversation. In: Peter Cole, Morgan Jerry L. (Eds.), *Syntax and Semantics*, vol. 3: *Speech Acts*. Academic Press, New York: 41–58.
- Gustafson, Lawrence A., Orne, Martin T., 1963. Effects of heightened motivation on the detection of deception. *Journal of Applied Psychology* 47, 408–411.
- Hancock, Jeffrey T., Curry, Lauren, Goorha, Saurabh, Woodworth, Michael, 2005. Automated linguistic analysis of deceptive and truthful synchronous computer-mediated communication. In: *Proceedings of the 38th Hawaii International Conference on System Sciences*. pp. 1–10.
- Hilgard, Ernest R., 1992. Divided consciousness and dissociation. *Consciousness and Cognition* 1, 16–31.
- Hollien, Harry F., 1990. *The Acoustics of Crime: The New Science of Forensic Phonetics*. Plenum, New York.
- Johnson, Marcia K., Raye, Carole L., 1981. Reality monitoring. *Psychological Review* 88, 67–85.
- Knapp, Mark L., et al., 1974. An exploration of deception as a communication construct. *Human Communication Research* 1, 15–29.
- Landau, Rachel, 1987. Harhetorika hasignonit ke'emtza'i shichnua bine'um hapoliti [Stylistic rhetoric as a means of persuasion in political oration]. *Balshanut Ivrit Chapashit* 24, 43–69.
- Landry, Kristine L., Brigham, John C., 1992. The effect of training in criteria-based content analysis on the ability to detect deception in adults. *Law and Human Behavior* 16, 663–676.
- Mey, Jacob, 1993. *Pragmatics: An Introduction*. Blackwell Publishers, Malden, MA.
- Miller, Gerald R., Burgoon, Judee K., 1996. Factors affecting assessments of witness credibility. In: Kerr, Norbert L., Bray, Robert M. (Eds.), *The Psychology of the Courtroom*. New York Academic Press, New York, pp. 169–194.
- Nir, Raphael, 1984. Lashon, Medium U'messer [Language, Medium, and Message]. Pazner & Sons, Jerusalem.
- Nir, Raphael, 1988. Rhetorika electoralit beyisrael: ha'imutim hatelevizioni'im [Electoral rhetoric in Israel: the televised debates]. *Bikoret u'farshanut* [Criticism and Commentary] 24, 81–111.
- Nir, Raphael, 1997. Hasisma hapolitit k'yechidat si'ach: habechirot laKnesset–1996 [The political slogan as a unit of discourse: the 1996 Knesset elections]. *Helkat Lashon* 24, 8–27.
- Nordhielm, Christie L., 2003. A dual-process model of advertising repetition effects. In: Scott, Linda M., Batra, Rajeev (Eds.), *Persuasive Imagery: A Consumer Response Perspective*. Lawrence Erlbaum Associates, New Jersey.
- Nordhielm, Christie L., Suzuki, Shunsuke, 2000. The differential influence of repetition on attention capture and affective response. In: Curtis, Haugtvedt, Wei-na, Lee, Jerome, Williams, Patricia, Devine (Eds.), *Proceedings of the 2000 Winter Conference of the Society for Consumer Psychology*. Washington, DC.
- O'Hair, Henry, et al., 1981. Prepared lies, spontaneous lies, machiavellianism, and nonverbal communication. *Human Communication Research* 7, 325–339.
- Rabon, Don, 1994. *Investigating Discourse Analysis*. Carolina Academic Press, Durham, NC.
- Reber, Arthur, 1992. The cognitive unconscious: an evolutionary perspective. *Consciousness and Cognition* 1, 93–133.
- Reber, Arthur, 1997. How to differentiate implicit and explicit modes of acquisition. In: Cohen, J., Schooler, J. (Eds.), *Scientific Approaches to Consciousness*. L. Erlbaum Associates, Mahwah, NJ, pp. 137–159.
- Sapir, Avinoam, 1987. *The LSI course on Scientific Content Analysis (SCAN)*. Laboratory for Scientific Investigation, Phoenix, AZ.
- Schwarzwald (Rodrig), Ora, 1997. Yediat lashon u'muda'ut lashon [Language knowledge and language awareness]. In: Bar-Asher, Moshe (Ed.), *Collections and Excerpts in Language 2: Essays on Hebrew Through the Ages—Memorial Collection for Shoshana Bahat*. The Academy of the Hebrew Language, Jerusalem, pp. 399–412.

- Shekel, Yair, Cohen, Akiva, 1978. Efscharuyot l'ivchun sheker b'emtzat haba'ot panim b'et mivchan poligraf: mechkar chalutz [Possibilities for the detection of falsehood by means of facial expressions during a polygraph examination: a pioneering study]. *Avaryanut U'stiya Chevratit* [Crime and Social Deviance] 6, 33–36.
- Shuy, Roger W., 1998. *The Language of Confession, Interrogation, and Deception*. Sage, Thousand Oaks, CA.
- Sornig, Karl, 1989. Some remarks on linguistic strategies of persuasion. In: Wodak, Ruth (Ed.), *Language Power and Ideology*. John Benjamins, Amsterdam, pp. 95–114.
- Sovran, Tamar, 2000. Chakiroi B'semantika Musagit: Hama'arag Haleshoni Vehahe'archut shel Musagim Mufshatim [Investigations in Conceptual Semantics: Linguistic Fabric and the Deployment of Abstract Concepts]. Magnes, Jerusalem.
- Sperber, Dan, Wilson, Deirdre, 1986. *Relevance: Communication and Cognition*. Harvard University Press, Cambridge, MA.
- Sporer, Siegfried L., 1997. The less traveled road to truth: verbal cues in deception detection in accounts of fabricated and self-experienced events. *Applied Cognitive Psychology* 11, 373–397.
- Stein, Nancy L., Glenn, Christine G., 1979. An analysis of story comprehension in elementary school children. In: Freedle, Roy O. (Ed.), *New Directions in Discourse Processing*. Ablex Publishing, Norwood, NJ, pp. 53–120.
- Steller, Max, Koehnken, Guenter, 1989. Criteria-based statement analysis. In: Raskin, David (Ed.), *Psychological Methods in Criminal Investigation*. Springer, New York, pp. 217–245.
- Toury, Gideon, Margalit, Avishai, 1973. Darchei hashimush hasoteh batziruf hakavul [Deviant use of bound combination]. *Hasifrut* [Literature] 4, 99–127.
- Tully, Bryan, 1998. Statement validation. In: Canter, David V., Alison, Laurence J. (Eds.), *Interviewing and Deception*. Ashgate [Dartmouth], Aldershot, England, pp. 83–103.
- Van Dijk, Teun A., 1997. The study of discourse. In: Van Dijk, Teun A. (Ed.), *Discourse as Structure and Process*. Sage Publications, London, pp. 1–34.

**Dr. Dilmon** is a teacher in the Department of Hebrew and Semitic Languages in Bar-Ilan University in Israel. She has a BA in Hebrew Linguistics and in Jewish Philosophy from the Hebrew University in Jerusalem, and a PhD from Bar-Ilan University in Ramat-Gan, Israel, Recipient of President's Fellowship for doctorate. The subject of her dissertation is: "Linguistic Differences Between Lie and Truth in Spoken Hebrew". Her research interests include Discourse analysis, Psycholinguistics and the language of fabrication. Dr. Dilmon also teaches linguistics in Talpiot College in Tel Aviv, and in Ashkelon Academic College in Israel.